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STRONG CONVERGENCE OF SOME EXPLICIT ITERATIVE PROCESSES WITH MEAN ERRORS FOR A CLASS OF QUASICONTRACTIVE OPERATORS

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Abstract. The purpose of this paper is to establish a strong convergence of two explicit iteration processes with mean errors to a common fixed point for a finite family of quasi-contractive operators in normed spaces or in generalized convex metric spaces. The results presented have generalize and improve the corresponding results of Berinde [1]-[2], Gu Feng [15], Rafiq [3]-[4], Rhoades [14], Şoltuz [10]-[11] and Zamfirescu [17].

Key Words and Phrases: Explicit iteration process with mean errors, common fixed point.

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References

[1] V. Berinde, *Iterative Approximation of Fixed Points*, Ed. Efemeride, Baia Mare, 2002.

[2] V. Berinde, *On the convergence of the Ishikawa iteration in the class of quasi-contractive operators*, Acta Mathematica Universitas Comenianae, New Series, **73**(2004), 119-126.

[3] A. Rafiq, *Fixed point of Ćirić quasi-contractive operators in normed space*, Math. Commun., **11**(2006), 115-120.

[4] A. Rafiq, *Strong convergence of a modified implicit iteration process for a finite family of Z-operators*, Int. J. Math. Sci., 2006, 1-6.

[5] A. Rafiq, *Fixed Point of Ćirić Quasi-contractive Operators in Generalized Convex Metric Space*, General Math., **14**(2006), 79-90.

[6] L.B. Ćirić, *A generalization of Banach's contraction principle*, Proc. Amer. Math. Soc., **45**(1974), 267-273.

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[7] S. Ishikawa, *Fixed points by a new iteration method*, Proc. Amer. Math. Soc., **44**(1974), 147-150.

[8] M.O. Osilike, *Stability results for fixed point itertion procedures*, J. Nigerian Math. Soc., **14/15**(1995/1996), 17-29.

[9] W.R. Mann, *Mean value methods in iteration*, Proc. Amer. Math. Soc., **4**(1953), 506-510.

[10] Ş.M. Şoltuz, *The equivalence of Picard, Mann and Ishikawa iterations dealing with quasi-contractive operators*, Math. Commun., **10**(2005), 81-89.

[11] Ş.M. Şoltuz, *The equivalence between Krasnoselskij, Mann, Ishikawa, Noor and multi-step iterations* , Math. Commun., **12**(2007), 53-61.

[12] Y. Xu, *Ishikawa and Mann iteration process with errors for nonlinear strongly accretive operator equations*, J. Math. Anal. Appl., **224**(1998), 91-101.

[13] H.K. Xu, R.G. Ori, *An implicit iteration process for nonexpansive mappings*, Numer. Funct. Anal. and Optimiz., **22**(2001), 767-773.

[14] B.E. Rhoades, Ş.M. Şoltuz, *On the equivalence of Mann and Ishikawa iteration methods*, Int. J. Math. Sci., **7**(2003), 451-459.

[15] Feng Gu, *Strong convergence of an explicit iterative process with mean errors for a finite family of Ćirić quasi-contractive operators in normed spaces*, Math. Commun., **12**(2007), 75-82.

[16] W. Takahashi, *A convexity in metric spaces and nonexpansive mappings*, Kodai Math. Sem. Rep., **22**(1970), 142-149.

[17] T. Zamfirescu, *Fix point theorems in metric spaces*, Arch. Math. (Basel), **23**(1972), 292-298.

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